LONG TERM STEWARDSHIP PLAN

PROCINO PLATING SITE (DE-0344)
901 SOUTH MARKET STREET
BLADES, SUSSEX COUNTY, DELAWARE

Prepared for:

State of Delaware
Department of Natural Resources and Environmental Control
Site Investigation and Restoration Section
391 Lukens Drive
New Castle, Delaware 19720

On behalf of:
Procino Enterprises, Inc.
901 South Market Street
Blades, Delaware 19973

Prepared by:
Ten Bears Environmental Associates Company
606 Federal Street
Milton, Delaware 19968

August 2016
Revised March 2018
TBE Project No. 11-1027.C

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I. INTRODUCTION

Ten Bears Environmental Associates Co. (TBE) has developed this Long Term Stewardship (LTS) Plan following the performance of a Remedial Investigation performed at the approximately 1.16-acre property known as the Procino Plating Site (DE-0344) located at 901 South Market Street in Blades, Sussex County, Delaware. Herein the subject property is referred to as "the Site" or "the Property". This LTS Plan format follows the format developed by the State of Delaware, Department of Natural Resources and Environmental Control, Site Investigation and Restoration Section (DNREC SIRS) in their February 2002 document titled, ***"Operation and Maintenance Guidance Document for HSCA and VCP Sites."***

As stated in DNREC's LTS guidance, this Plan contains information required to be a "stand alone document" for use by the persons responsible for performing the LTS activities at the Site. This plan contains the following information:

- A listing of the roles and responsibilities of the persons or entities tasked with implementing the LTS activities,
- A summary of the project background and Remedial Investigation results,
- A description of the remedial actions set forth in the Final Plan of Remedial Action for the Site, and
- A listing of the site-specific required LTS actions, their locations, and the timeframe for maintaining the selected remedy at the property.

II. LTS ORGANIZATION AND RESPONSIBILITIES

The names and roles of the individuals and entities tasked to implement the activities described in this LTS Plan are listed below:

1. Site Owner

Procino Enterprises, Inc.
901 South Market Street
Blades, DE 19973
Attention: Mike Procino
Phone: (302) 629-0331

2. Site Owner's Environmental Consultant

Ten Bears Environmental
Attention: Ex. 4 CBI
606 Federal Street
Milton, DE 19968
Ex. 4 CBI @tenbears.us [or Ex. 4 CBI @tenbears.us]
Phone: (302) 684- [or 302 731 Ex. 6 Personal Privacy (PP)]

3. DNREC-SIRS Project Manager

Ms. Stephanie Gordon
State of Delaware
Department of Natural Resources and Environmental Control
Site Investigation & Restoration Section
391 Lukens Drive
New Castle, DE 19720
Stephanie.Gordon@state.de.us
Phone: (302) 395-2600

III. PROJECT OVERVIEW

A. PROJECT LOCATION AND DESCRIPTION

The approximately 1.16-acre Site is located on the west side of South Market Street (Alternate Delaware Route 13) at the intersection with West 9th Street in Blades, Sussex County, Delaware (Figure 1). The Site consists of two Sussex County tax parcels (tax parcel no. 132-1.15-187.00 and 132-1.15-188.00). The Site is bounded by South Market Street on the east, a Conrail track on the west, West 9th Street to the north, and West 10th Street to the south.

The Site and the surrounding areas to the north, east, and south lie within the municipal boundaries of the Town of Blades and are provided public water and sewer service by the Town. The surrounding area is largely in residential use although a commercial use area lies directly south of the Site. As shown on Figure 2, the "L-shaped" site is occupied by two large buildings and a smaller storage building. Paving and gravel cover a parking area on the north side of the buildings and a drive to the west which connects to West 10th Street. Figure 2 also shows the locations of six (6) groundwater monitoring wells (MW-1 through MW-6) installed at the Site by DNREC for their 2011 Site Inspection. Chromium was detected in the groundwater sample from MW-6 at a concentration above the 100 micrograms per liter (ug/L) primary drinking water standard in the 2011 Site Inspection.

A Remedial Investigation (RI) was conducted by Ten Bears Environmental for Procino Enterprises over 2012-2016 to determine the magnitude and extent of environmental site conditions, primarily the distribution of chromium in groundwater identified by DNREC SIRS in 2011, and to evaluate the potential for site conditions to impact human health and the environment. A network of eight (8) additional shallow wells (MW-7 though MW-15) and three (3) deep wells (DMW-1, DMW-2, and DMW-3) was installed to assess conditions on the southerly parts of the Site and on adjacent properties during the Remedial Investigation. Figure 3 shows the locations of the RI wells, including those proposed for future Long Term Stewardship groundwater sampling, as well as the findings of the RI regarding the direction of groundwater flow and chromium concentrations in the most recent May 2015 groundwater samples.

B. PROPERTY USE

1. HISTORIC SITE USE

According to aerial photographs obtained from the former Delaware DataMIL website, the large building on the eastern part of the Site was constructed after 1937 photograph but prior to the 1954 photograph; its original use is not known.

Procino Plating began operations in 1983 performing ornamental /decorative plating using copper, nickel and chrome, and moved onto the Blades premises in 1985. Chrome was stored in two tanks inside the plant adjacent to the MW-6 location. A second building was added in 1993 primarily to house silver and electroless nickel plating for commercial and military customers. Procino Plating purchased the two Site parcels in May and July of 1996. In approximately 1996, Procino Plating installed a subsurface wastewater collection and treatment system to collect and treat the wash and rinse "bath" water and the floor drains from the plant. The business employed 60 people at its peak in 1997.

Two small storage buildings were constructed south of the 1993 building between 1997 and 2002. Following business downturns, the plating process in the 1993 building was dismantled in 2007, and the wastewater piping system and drains were sealed with concrete. The chrome tanks were drained and removed from service in 2009.

2. CURRENT SITE USE

The business currently employs 10 persons and performs a much reduced operation of fabrication of griddle tops and associated hard chrome plating. Small quantities of hazardous waste are generated which are periodically shipped offsite for disposal at a permitted facility.

C. ENVIRONMENTAL INVESTIGATIONS AND FINDINGS

1. DNREC NOTICES OF VIOLATION – 1994-1998

At startup in 1985 Procino Plating was issued an Industrial Wastewater Contribution Permit by Sussex County which allowed them (subject to permit limitations) to discharge pretreated process wastewater into the Town of Blades Sanitary Sewer system. Procino Plating also generated hazardous waste onsite, including filter-cake from the wastewater pretreatment system, which was managed under the "cradle to grave" hazardous waste disposal program and shipped off site to permitted disposal or recycling facilities.

Three Notices of Violation (NOV) were issued to Procino Plating from DNREC citing labeling, training and operational deficiencies related to the handling of hazardous waste. A June 1994 NOV was corrected as stated in an October 1994

DNREC letter; an October 1995 NOV was corrected per in a March 1996 DNREC letter; a December 1998 NOV was issued with a subsequent corrective action. None of the NOVs cited spillage, discharges, or releases of hazardous wastes.

2. EPA INSPECTIONS – 2002-2010

The US EPA conducted compliance inspections of the Procino facility in September 2001 which resulted in a February 2002 NOV citing hazardous waste management violations for exceedance of the 90-day onsite storage timeframe; again no spillage, discharges or releases were involved. In December 2007 and 2008, DNREC and the US EPA conducted inspections, collected samples and interviewed employees at the Procino Plating Site. These inspections coincided with the discontinuation of plating operations in the second building when equipment was being dismantled to create rental space.

In May 2010 the EPA exercised a search warrant and seized the company records and took samples. These actions and the follow up investigation conducted by the EPA led to criminal charges against Procino Plating (since resolved) regarding the storage of unpermitted hazardous wastes and violations of their wastewater treatment permit, the latter due to new permit conditions prohibiting certain hazardous wastes from being treated and discharged into the sewer system. Although the discharge of cyanide was evaluated in EPA's investigation, no evidence was shown that cyanide was spilled, disposed or released from the site. Likewise, no charges were presented indicative of a release of hazardous substances at the site. Subsequently, Procino Plating terminated its use of the industrial wastewater discharge permit, concreted the piping, and modified its operations by use of a closed loop system.

3. SITE INSPECTION (DNREC-SIRS)- 2011

DNREC SIRS conducted a Site Inspection (SI) in May of 2011 in accordance with their March 2011 Work Plan, also under a cooperative agreement with EPA. Seven shallow soil borings were drilled to 10 feet, and six deeper borings (to 20 feet) were completed for the installation of six groundwater monitoring wells (MW-1 through MW-6, see Figure 2). During drilling, 26 soil samples were collected (two depths in each of 13 borings) and analyzed at SIRS's lab, from which five were sent to a HSCA approved lab for confirmatory analyses. Six groundwater samples were collected and analyzed by DNREC's Environmental Lab (Dover, Delaware) for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and total and dissolved metals; analysis of pesticides, PCBs, and cyanide was performed at a HSCA laboratory. Drinking water samples collected by DNREC's Office of Drinking Water (ODW) were collected from twelve home wells in the neighborhood west-southwest of Procino Plating and were analyzed for trace metals, cyanide, and VOCs by the State of Delaware's Public Health Laboratory (Smyrna, Delaware).

DNREC SIRS's soil analyses of the 26 soil samples reported no detectable levels of VOCs or SVOCs, or elevated metals; chromium concentrations were below DNREC's 35 mg/kg Uniform Risk-Based Standard (URS) for residential hexavalent chromium. The results from the HSCA-approved laboratory confirmed that, except for iron (which was considered to be background), soil concentrations were below residential URS's. Groundwater sample results reported chromium in one sample (MW-6) and a pesticide (dieldrin) in three samples at concentrations above EPA's Maximum Contaminant Level (MCL) for drinking water, also DNREC's groundwater screening levels. Eight (8) of the 12 domestic well samples contained manganese and one sample contained zinc at concentrations above EPA's secondary MCL; the elevated zinc was not confirmed in a later ODW re-sampling event.

Based upon the detection of chromium and dieldrin in Site groundwater samples and the nearby (possibly downgradient) use of groundwater as potable water, DNREC required further evaluation of the Procino Plating Site in a Remedial Investigation performed under their Voluntary Cleanup Program.

4. REMEDIAL INVESTIGATION 2012-2015

Procino Plating entered into a Voluntary Cleanup Program agreement with DNREC in 2011. The RI planning and scoping began in January of 2012. RI activities were performed in phases in accordance with TBE's Work Plans and DNREC input. A Work Plan was submitted to SIRS in January 2012, revised and resubmitted to SIRS March 21st, revised per a DNREC SIRS comment letter of April 2, and resubmitted April 6, 2012 along with a HASP and Sampling and Analysis Plan. Following DNREC's approval, RI field work was performed in late April – May 2012 which included the installation and sampling of MW-7, MW-8, and MW-9, resampling of several SI wells, and a soil source delineation. Phase I RI findings were submitted to DNREC in September 2012 which included recommendations for additional groundwater sampling.

After a scoping meeting on November 16, 2012, TBE submitted a Phase II Work Plan (WP) on December 5, DNREC SIRS' commented on the WP (January 17, 2013), the revised WP was submitted (January 30, 2013) which was approved by SIRS March 12, 2013. Subcontractor procurement and offsite property access approvals were conducted in April of 2013. Wells MW-10, MW-11, MW-12, deep wells DMW-1 and DMW-2 were installed and sampled in mid-2013. A draft RI Report was compiled and submitted to DNREC in August of 2013. DNREC issued an April 2014 comment letter requiring additional RI work. After a planning and access approval period, additional samples were collected in May of 2014.

After receipt of the May 2014 groundwater samples, DNREC required additional chromium delineation through the installation of additional wells downgradient (south and east) of existing wells. After a fall 2014 planning and scoping period with DNREC and a lengthy access negotiation period with property owners, Phase III wells (MW-13, -14, -15 and Deep MW-3) were installed in April 2015 and sampled in May 2015.

After a soil sampling and delineation effort, Procino Plating conducted an Interim Action Soil Removal in July 2015 in which approximately 14 tons of chromium-impacted soil were removed from the suspected source area inside and under the Procino Plating building and transported to a permitted facility for proper disposal. The excavation area was backfilled with non-impacted site soils (as determined in the sampling effort), concrete rubble, clean crushed rock and sand, then capped with a new concrete floor slab.

Chromium groundwater plume boundaries were delineated by the performance of several groundwater RI sampling events. Consistently lesser chromium concentrations were reported over 2012–2015, showing a reduction in the secondary release from soil to groundwater and demonstrating attenuation of the extent and magnitude of the groundwater plume. The May 2015 sample results (see Figure 3) showed the plume extended approximately 200 feet from the source area (MW-6) to the farthest, lowest downgradient detection of chromium (MW-11). The May 2015 data also showed that the levels of chromium in offsite groundwater downgradient of the Site were below the drinking water MCL, thus could theoretically be ingested (although the properties are connected to Town of Blades public water) without incurring human health ingestion risks.

IV. FINAL REMEDIAL ACTION REQUIREMENTS

After evaluation of the Site record, DNREC SIRS issued a ***Proposed Plan of Remedial Action (July 24, 2016)*** for the Procino Plating Site. The Proposed Plan's 20-day public comment period closed with no comments received from the public. The Proposed Plan was therefore adopted as DNREC's ***Final Plan of Remedial Action.***

The Final Plan included the following remedial actions which need to be completed before DNREC will issue a Certificate of Completion of Remedy (COCR):

1. Remediation of total chromium in groundwater to concentrations below the USEPAs Maximum Contaminant Level (MCL) for drinking water.

2. A Long-Term Stewardship Plan shall be submitted to DNREC for approval within 60 days of the issuance of the Final Plan of Remedial Action. The LTS plan will: 1) detail the groundwater monitoring requirements and schedule to be followed in order to monitor the natural attenuation of chromium in groundwater; and 2) include a trigger mechanism for active groundwater remediation if monitoring indicates the need.

3. The LTS Plan must be implemented within 60 days of its approval by DNREC.

4. A Remedial Action Completion Report must be submitted to DNREC within 60 days of the completion of the remedial actions required in this Proposed Plan.

5. A request for a Certification of Completion of Remedy (COCR) must be submitted to DNREC within 60 days of approval of the Remedial Action Completion Report.

This LTS Plan has been developed to meet the requirement of the ***Final Plan of Remedial Action*** as stated above.

V. LONG TERM STEWARDSHIP ACTIVITIES

A. GROUNDWATER MONITORING PROGRAM

Per the Final Plan, the LTS Plan describes: 1) the groundwater monitoring requirements and schedule to be followed in order to monitor the natural attenuation of chromium in groundwater; and 2) include a trigger mechanism for active groundwater remediation if monitoring indicates the need.

1. GROUNDWATER MONITORING LOCATIONS & FREQUENCY

Wells selected for LTS monitoring are indicated on Figure 3. The rationale for their selection are:

- 1 groundwater sample from upgradient well MW-3 to assess water quality coming onto the Site;
- 1 groundwater sample from the "near source" well MW-6, the "worst case" location;
- 3 samples from downgradient wells MW-10, MW-11, and MW-15 to monitor changes to water quality at the limits of the chromium plume south of the source, and on the southwest and southeast plume boundaries, respectively.
- 1 duplicate groundwater sample from MW-6 for quality assurance /quality control purposes.

Groundwater samples will be collected on a quarterly basis for the first year of LTS monitoring. After the first year, a semiannual sampling period may be approved by DNREC pending trends in groundwater constituent concentrations.

2. GROUNDWATER SAMPLE COLLECTION & ANALYSIS

Depth to groundwater will be measured at each well prior to sample collection. Wells will be purged and groundwater samples will be collected per DNREC's Standard Operating Procedures for Low Flow Sampling. Field measurements of temperature, pH, conductance, dissolved oxygen, and Oxidation-Reduction Potential will be recorded during the purging until relative stability is attained. Purge water will be containerized and staged onsite pending lab analysis of the groundwater samples; purge water from samples with concentrations below MCLs will later be discharged to the ground surface near the well. Samples will be collected using single-use disposable tubing into laboratory clean glassware. Dissolved metals samples will each be field filtered using a 45-micron disposable filter. The groundwater samples will be submitted to a HSCA-approved laboratory for analysis of Total Organic Carbon (EPA 415.1) and total and dissolved chromium, iron, and manganese by SW-846 6020.

The decrease in aquifer chromium concentration is interpreted to occur by several geochemical processes collectively termed "natural attenuation". These processes include dissolution of primarily hexavalent chromium into groundwater, reductive transformation of the hexavalent species to trivalent species due to oxidation-reduction reactions in the aquifer, and subsequent sorption of the trivalent chromium onto downgradient soil. RI data showing that groundwater conditions at the Site are conducive to the action of natural attenuation processes include: acidic groundwater pH (high hydrogen activity); a decrease in dissolved oxygen (DO) levels to reducing conditions; elevated source area measurements of Eh / Oxidation-Reduction Potential (electron activity); and naturally occurring concentrations of iron and manganese in groundwater to act as reducing agents (to transform the Cr+6 to Cr+3) and organic carbon in the aquifer to facilitate metals sorption.

The evidence supporting the presence of natural attenuation processes is a retardation of the plume extent due to the rapidly diminishing chromium concentrations in groundwater samples.

3. GROUNDWATER RESULTS REPORTING

DNREC will receive a brief letter summary report containing a copy of the laboratory report results of the groundwater sample analyses within five calendar days of Ten Bears' receipt of the results from the lab. The groundwater sampling results from the first 4 quarters will be compiled into an Annual LTS Report and submitted to DNREC.

4. TRIGGER FOR ADDITIONAL GROUNDWATER EVALUATION

It is anticipated that the 5-year trend of decreasing chromium concentration in groundwater will continue to be observed over the LTS compliance period. Should chromium levels be observed to rise, the next quarterly event will occur as scheduled to assess the apparent increase. If increased levels are verified in the second event, additional samples will be collected from nearby wells identified in cooperation with DNREC to attempt to identify the impacted area and determine the cause. Elevated chromium concentrations above the MCL and increasing each of four consecutive sampling events will trigger the evaluation of active remediation.

VI. HEALTH AND SAFETY CONSIDERATIONS FOR LTS ACTIONS

Any workers tasked to do Long Term Stewardship monitoring (measurement and sample collection) of groundwater must have training and follow the appropriate health and safety guidelines established by the Occupational Safety and Health Administration (OSHA) for activities on Hazardous Waste sites. These guidelines have been described in the Site Specific Health and Safety Plan (HASP). However, activities pertaining to soil at the ground surface for maintenance or repairs such as gravel grading or replacement, lawn care, etc., may be performed by appropriate contractors or site maintenance personnel who do not have specialized OSHA training.

VII. RECORD KEEPING AND REPORTING

In accordance with DNREC's "***Operation and Maintenance Guidance Document for HSCA and VCP Sites,***" dated February 2002, specific procedures have been established for the documentation of LTS activities. Groundwater Sampling Field Data Sheets (see Appendix A) will be completed for each groundwater sample. Photographic documentation will be provided if changes in Site conditions are observed.

VIII. COMPLIANCE PERIOD

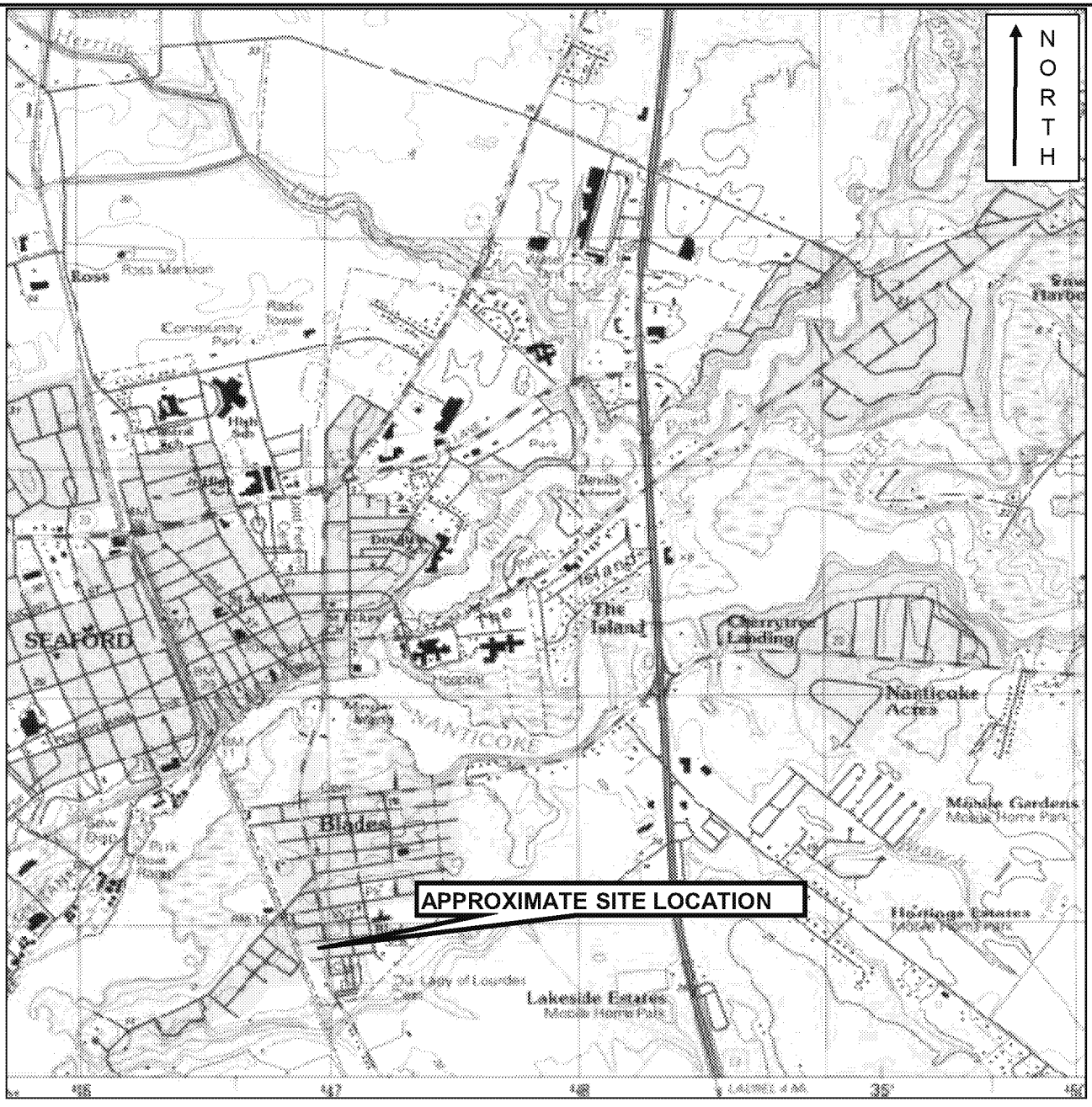
The initial proposed LTS Compliance period is two years. After the first year of quarterly groundwater sampling, the groundwater data will be compiled and submitted to DNREC-SIRS in an Annual LTS Report. At that time, DNREC will review the results and reach a decision whether to require quarterly monitoring for the second year of LTS groundwater sampling efforts, or if semiannual monitoring is acceptable based upon groundwater concentrations. A second Annual LTS Report will be compiled summarizing the results of the second year of the LTS program and submitted to DNREC SIRS.

IX. LTS / PROJECT CLOSEOUT

A Remedial Action Completion / Project Closeout Report will be submitted to DNREC within 60 days of their approval of this Long Term Stewardship Plan, which is the only remedial action required in the Final Plan of Remedial Action. Within 60 days of DNREC SIRS approval of the Remedial Action Completion / Project Closeout Report, we will request that DNREC issue a Certification of Completion of Remedy (COCR) to Procino Enterprises.

Unless a change from the observed diminishing trend is observed in the groundwater chromium concentrations, and if chromium concentrations have attained the 100 ug/L EPC MCL, it is anticipated that the LTS program can be discontinued after the second year of LTS monitoring.

FIGURES



This location sketch was adapted from the USGS Topographic Map
for the Seaford East Quadrangle, Sussex County, Delaware (1992)

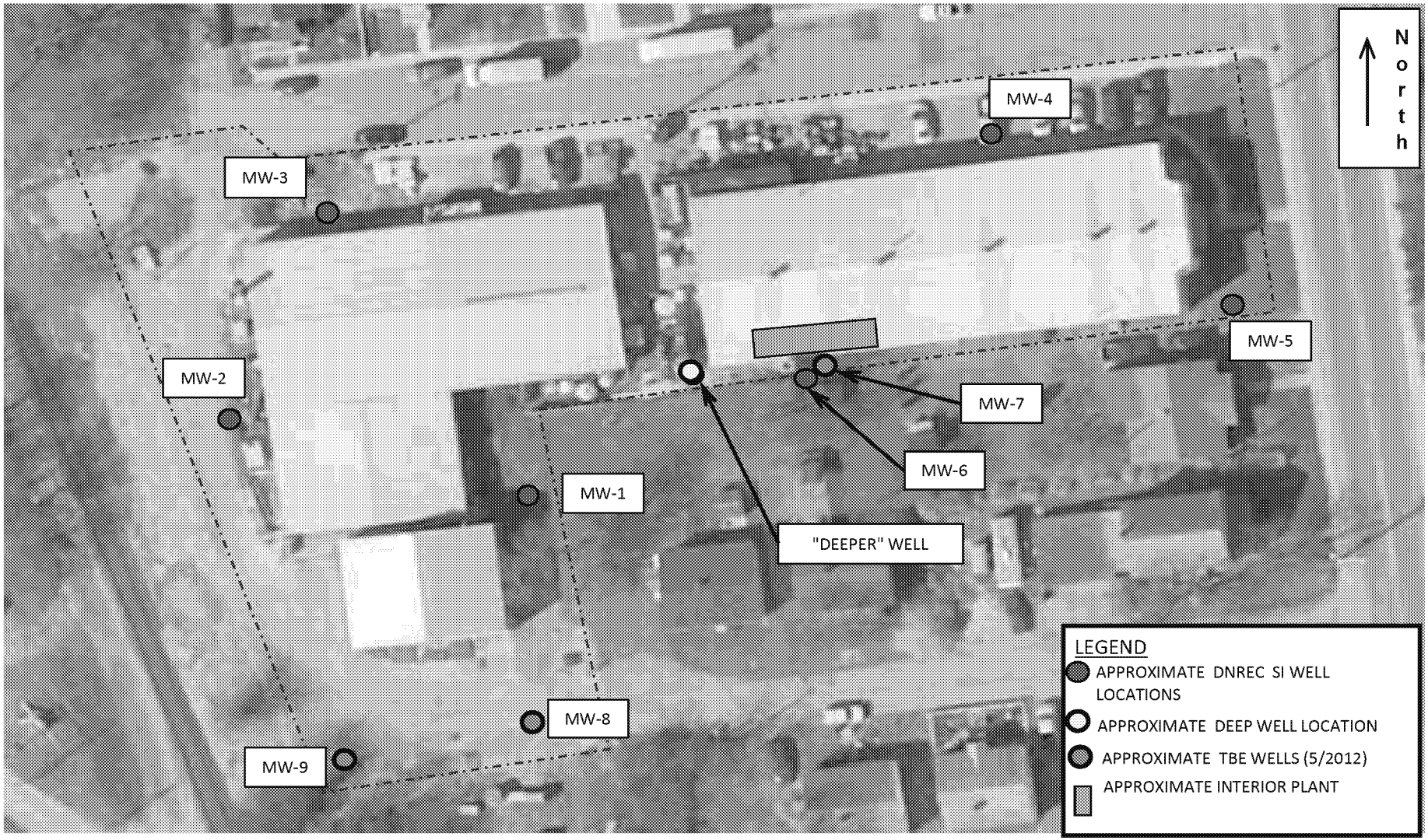
Ten Bears Environmental

Ten Bears Environmental
1080 South Chapel Street
Newark, Delaware 19702
Phone: (302) 731-8633 Fax: (302) 731-8655

FIGURE 1 - SITE LOCATION MAP

PROCINO PLATING PROPERTY
901 SOUTH MARKET STREET
BLADES, SUSSEX COUNTY, DELAWARE

DATE: 5/28/2015	JOB NUMBER: 11-1027.A
DRAWN BY: BKG	SCALE: 1 inch = approx 2,000 feet
CHECKED BY: EWR	FIGURE NO: 1
FILE NO: 11-1027.AFIGS	SHEET 1 OF 1



Note: This drawing was adapted from a 2007 aerial photograph obtained from the Delaware DataMIL Internet site.

FIGURE 2 - SITE LAYOUT and 2011 -2012 MONITORING WELL LOCATIONS
PROCINO PLATING PROPERTY
901 SOUTH MARKET STREET
TOWN OF BLADES, DELAWARE

Ten Bears Environmental
Ten Bears Environmental
606 Federal Street
Milton, Delaware 19968
Phone: (302) 684-5080 Fax: (302) 684-5081

DATE:	5/30/2012	JOB NUMBER:	11-1027.B
DRAWN BY:	KJL	SCALE:	1" = approx. 50'
CHECKED BY:	EWR	FIGURE NO:	2
FILE NO:	111027B.FIG	SHEET	1 OF 1

Ex. 9 Wells & Ex. 6 Personal Privacy

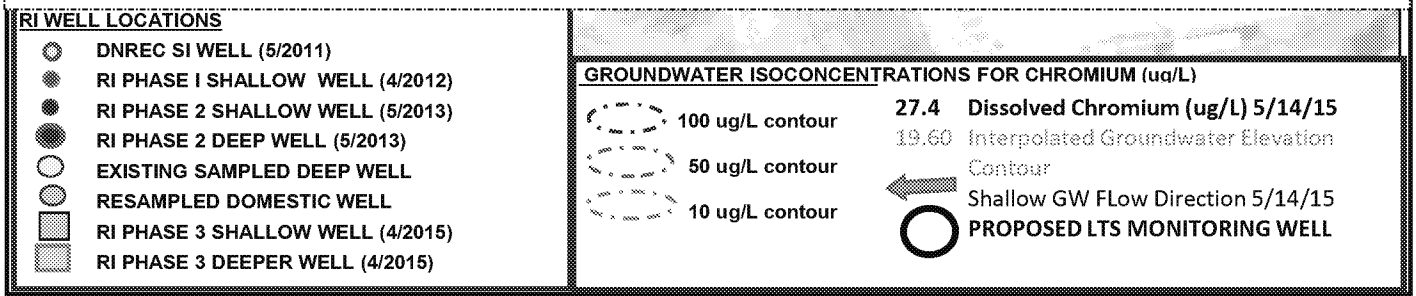


FIGURE 3 - LTS GROUNDWATER WELL LOCATIONS
(from RI Figure 24)
PROCINO PLATING FACILITY (DE-0344)
BLADES, SUSSEX COUNTY, DELAWARE

Ten Bears Environmental
1080 South Chapel Street
Newark, Delaware 19702
Phone: (302) 731-8633 Fax: (302) 731-8655

DATE: 08/20/2016	JOB NUMBER: 11-1027.C
DRAWN BY: EWR	SCALE: 1 INCH = 100 FEET (APPX)
CHECKED BY: RCG	FIGURE NO: 3
FILE NO: 11-1027.C-FIGS	SHEET 1 OF 1

APPENDIX A

EXAMPLE GROUNDWATER SAMPLING
FIELD DATA SHEET

TEN BEARS ENVIRONMENTAL
NEWARK, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: _____ **Project Number:** _____

WELL ID:

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL (gal)	STICKUP HEIGHT*	DATE / TIME

Note: For 4" wells, one well volume equals [well depth] minus [depth to water] multiply by (0.66); for 2" well multiply by (0.17); for six inch well multiply by (1.5); for 1" wells multiply by (0.035) for gallons or 0.15 for Liters. 1 well volume = 0.235

PURGE TECHNIQUE: _____
PURGING EQUIPMENT: _____
PURGE RATE: _____
PURGE START / STOP TIME: _____
TOTAL VOLUME PURGED: _____

Water Quality Meter Make / Model:

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
(24-hour)	(pH units)	(mS/cm)	(NTU)	(mg/L)	(^{o}C)	(mv)

Note: Stabilization is achieved after all parameters have stabilized for 3 successive readings (3 to 5 minute intervals).
3 successive readings should be within **± 0.1 for pH, ± 3% for conductivity, ± 10mv for ORP, ± 10% for DO and turbidity**

Sample collected for laboratory analysis at _____

Laboratory analysis requested: _____

Bottles Filled:
1 liter amber: _____ 250 ml cyanide: _____
40 ml HCL: _____ 250 ml metals (unfiltered): _____
250 ml metals (filtered): _____ 250 ml amber: _____

Comments: _____

* Top of inner casing above (below) ground surface.